National Institute of Environmental Health Sciences

The impact of meteorological conditions on patch test results with 12 standard series allergens (fragrances, biocides, topical ingredients)

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Abstract:

BACKGROUND: Fluctuating irritability of the skin induced by low ambient temperature and humidity may compromise the reproducibility of patch testing. OBJECTIVES: To assess the impact of temperature and absolute humidity at the time of patch testing on the occurrence of irritant or doubtful (IR/?), weak positive (+) and (strong) positive (++/+++) reactions, respectively, among 12 allergens included in the German Standard Series. METHODS: Analysis of clinical data collected in the surveillance network IVDK (http://www.ivdk.org) between January 1993 and December 2001 (n Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 73 691 patients) combined with meteorological data obtained by the national services in Germany and Austria. Multinomial logistic regression analysis was used to estimate the risk associated with temperature, absolute humidity and vapour pressure, respectively, adjusted for sex, age, atopic dermatitis and duration of patch test application. RESULTS: For low temperature and humidity, a relevant increase of IR/? reaction frequency was observed in the cases of paraben mix and (chloro-) methylisothiazolinone. Both IR/? and + reactions were significantly increased with respect to the allergens fragrance mix, oil of turpentine, methyldibromo glutaronitrile + phenoxyethanol and particularly formaldehyde, while ++/+++ reactions were hardly affected by weather conditions. CONCLUSIONS: The observed increase of IR/? reactions may be due to epidermal barrier function impairment. The impact of dry/cold weather on + reactions in terms of possibly false-positive reactions is restricted to few allergens. In the case of + reactions of unknown relevance, a re-test under warm conditions or verification tests such as the repeated open application test or the provocative use test may be recommendable.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany;Austria

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Dermatological Effect, Other Health Impact

Other Health Impact: skin allergies

Medical Community Engagement: ☑

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content